

Comparisons of the Overwintered Drought Code

- Questions

- What difference does overwintering make in the CFFDRS indices?
- Are these differences relevant for fire management and fire suppression decisions?
- What are the breakpoints where the differences would make a difference?

Comparisons of the Overwintered Drought Code

- What we found.
 - Differences lessen through the season particularly when there is ample rainfall.
 - The differences in the BUI between overwintering and default are greatest with a high DMC, high overwintered DC and low defaulted DC.
 - The differences in the FWI become irrelevant as the differences between the DC's decrease and as the defaulted DC climbs above 200.

Overwintering

- Ending fall DC
- Over winter precipitation
 - Must be estimated from snowpack in most cases.
- User selected factors to adjust for local condition such as “chinook prone” or “poorly drained.”
- These are applied in a calculation to come up with a spring starting DC that may be higher than the default of 15.
- If the calculation comes out lower, 15 is used.

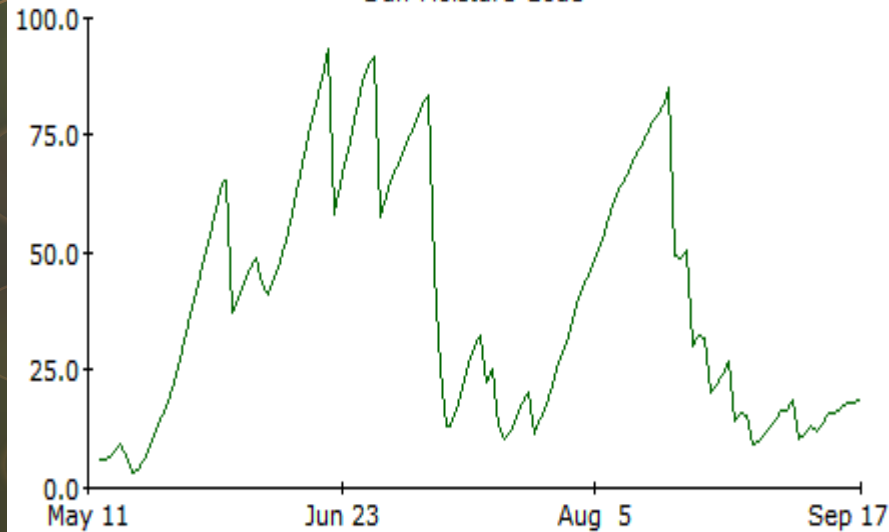
	Carryover	Precip	Fall	Winter	Fall	Spring	Spring	
	Fraction	Fraction	DC	Precip (mm)	Moisture (%)	Moisture (%)	DC	Remarks
PABI	1	0.9	568	84	193	491	195	Estimated from snow course data
OKL	1	0.9	491	95	234	571	135	Estimated from snow course data
BTA	0.75	0.9	565	120	195	572	134	Estimated from snow course data
BTA	0.75	0.5	565	120	195	383	295	Estimated from snow course data
DON	0.75	0.75	540	120	207	510	180	Estimated from snow course data
JCK	0.75	0.75	528	120	214	515	176	Estimated from snow course data

BTA Overwintering Discussion 2013

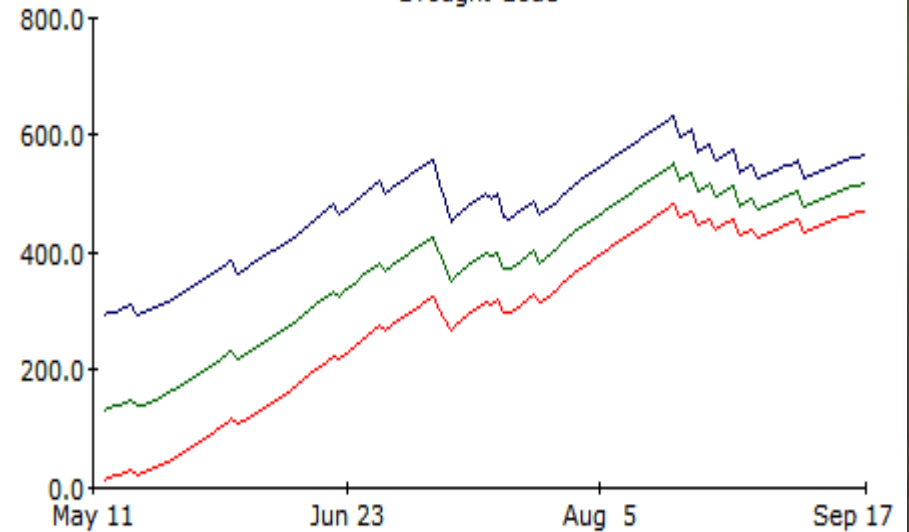
- BTA chosen due to high overwintered DC of 134 or 295
 - Depending on Precipitation effectiveness factor of 0.9 or 0.5
- Although the DC differences are significant through most of the season, the BUI and FWI differ less.
- Greater BUI differences when the DMC is greatest and early in the season.
- Lesser differences later in the season when the DC's are higher and closer.

BTA 2013 DC-15, DC-134, DC-295

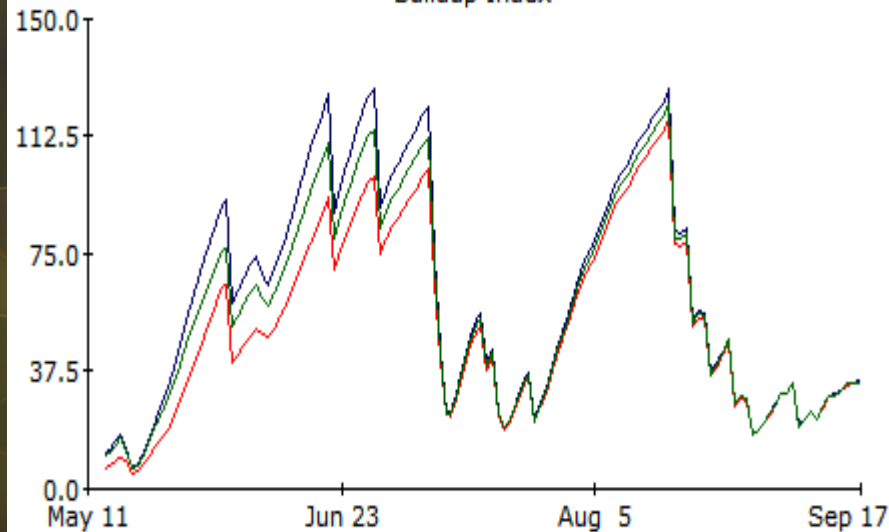
Duff Moisture Code



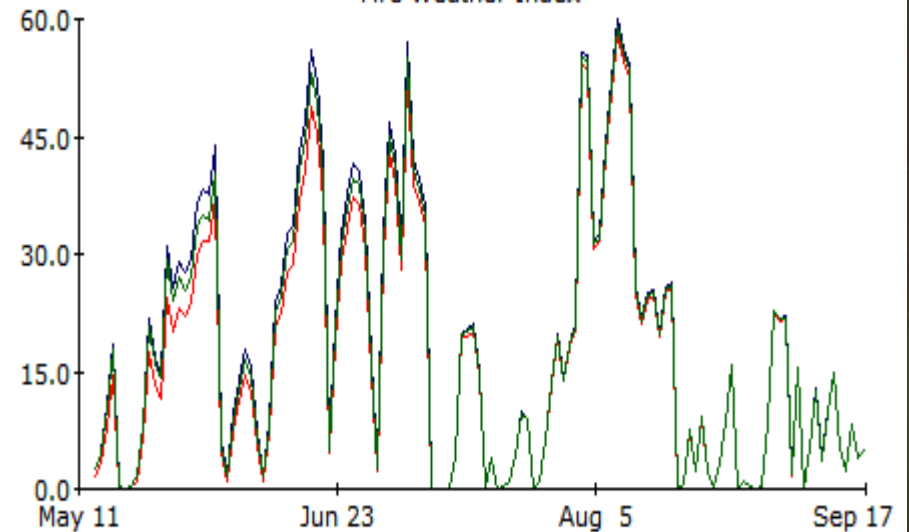
Drought Code



Buildup Index



Fire Weather Index



What are the Differences in Fire Behavior Calculations?

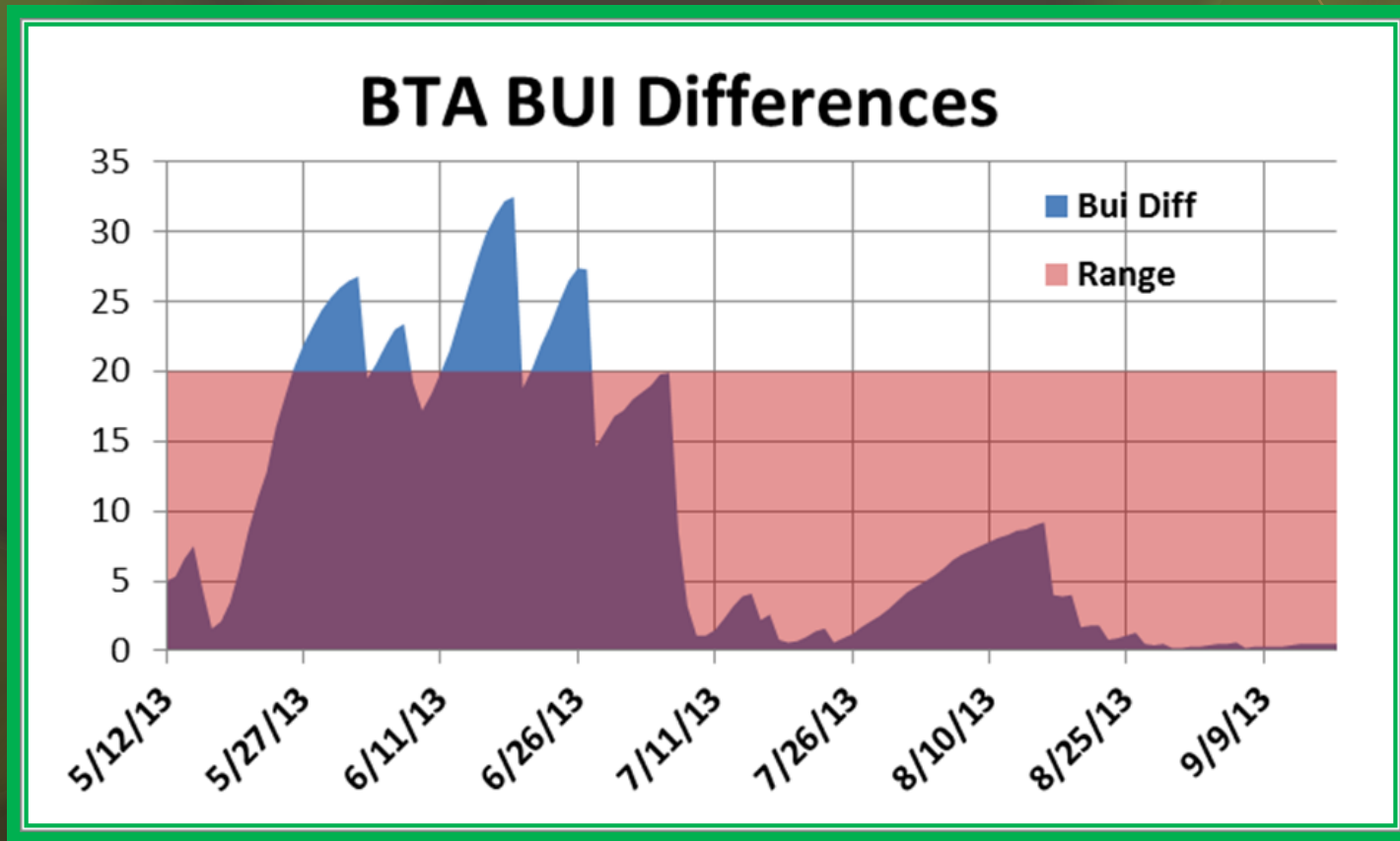
- Fire Behavior Tables for **rates of spread** use BUI ranges of 20.
- This means that the intensity rating would generally only differ by one class, if at all. The greatest differences would be with a high ISI.
- Are these differences relevant and are they seen in the observed fire behavior?

2.5.5 C-2, Boreal Spruce
Open, Rate of Spread in ch/hr
 Multiply by 1.1 to get feet/min
 Divide by 80 to get miles/hour
 Divide by 3 to get meters/min
Torching, Active Crown Fire

Intensity Class	Flame Length	FLI kW/m	FLI BTU/ft/sec
1	up to 1	10	3
2	up to 4	500	145
3	up to 8	2000	578
4	up to 12	4000	1156
5	up to 18	10000	2891
6	> than 18	10000	2891

		Buildup Index (BUI)									
ISI		10	30	50	70	90	110	130	150	170	190
1	0.3	1	1	2	2	2	2	2	2	2	2
2	0.9	3	4	4	5	5	5	5	5	5	5
3	2	6	7	8	8	9	9	9	9	9	9
4	3	8	11	12	12	13	13	13	14	14	14
5	4	11	15	16	17	18	18	18	19	19	19
6	5	15	19	21	22	23	23	24	24	24	24
7	6	18	23	26	27	28	29	29	30	30	30
8	7	22	28	31	32	34	34	35	35	36	36
9	8	25	32	36	38	39	40	41	41	42	42
10	9	29	37	41	43	45	46	47	48	48	48
11	10	33	42	46	49	51	52	53	54	54	54
12	11	37	47	52	55	57	58	59	60	61	61
13	12	41	52	57	61	63	64	66	66	67	67
14	14	45	57	63	66	69	70	72	73	74	74
15	15	49	62	68	72	75	77	78	79	80	80
16	16	52	66	74	78	81	83	84	85	86	86
17	17	56	71	79	84	87	89	91	92	93	93
18	18	60	76	84	89	93	95	97	98	99	99
19	20	64	81	90	95	99	101	103	104	105	105
20	21	68	86	95	101	104	107	109	111	112	112
21	22	72	91	100	106	110	113	115	117	118	118
22	23	75	95	106	112	116	119	121	123	124	124
23	24	79	100	111	117	122	125	127	129	130	130
24	25	83	105	116	123	127	130	133	135	136	136
25	26	86	109	121	128	133	136	139	141	142	142
26	27	90	114	126	133	138	142	144	146	148	148
27	28	93	118	131	138	143	147	150	152	154	154

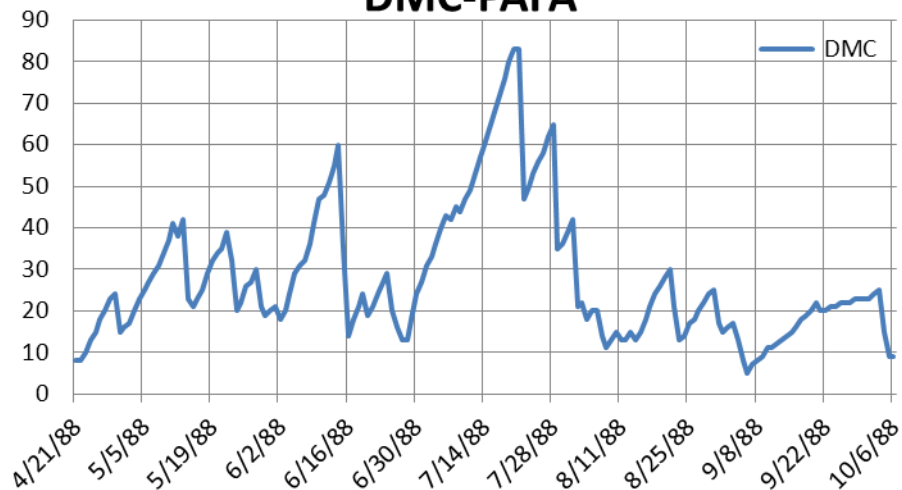
Differences Between Overwintered and Default BUI



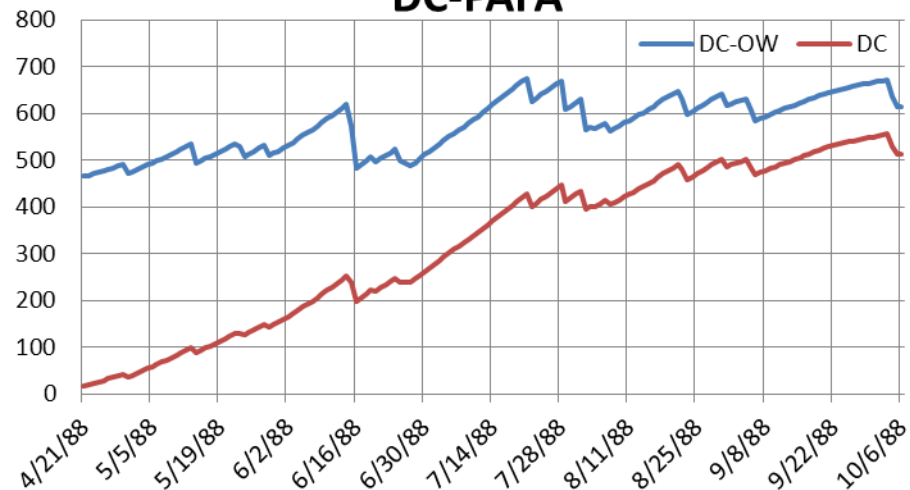
PAFA 1988

- PAFA (Fairbanks Intl Airport) 1988 was chosen because it was the extreme example of a high starting overwintered DC of 460.
- BUI and FWI differences are greatest early in the season when the default DC is low and the DMC is high.
- This was a busy year with 2.1 million acres burned and an extended dry period from the end of June through most of July and heavier rainfall at the end of July with the DMC dropping to season ending values.

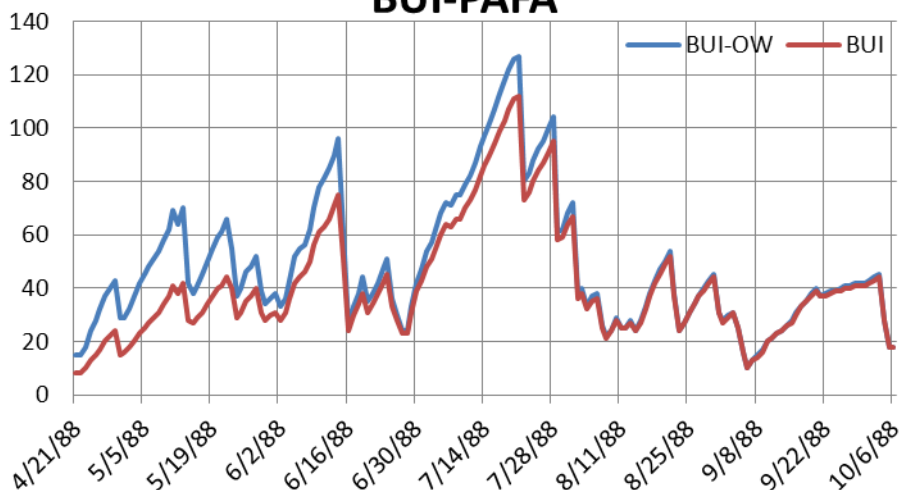
DMC-PAFA



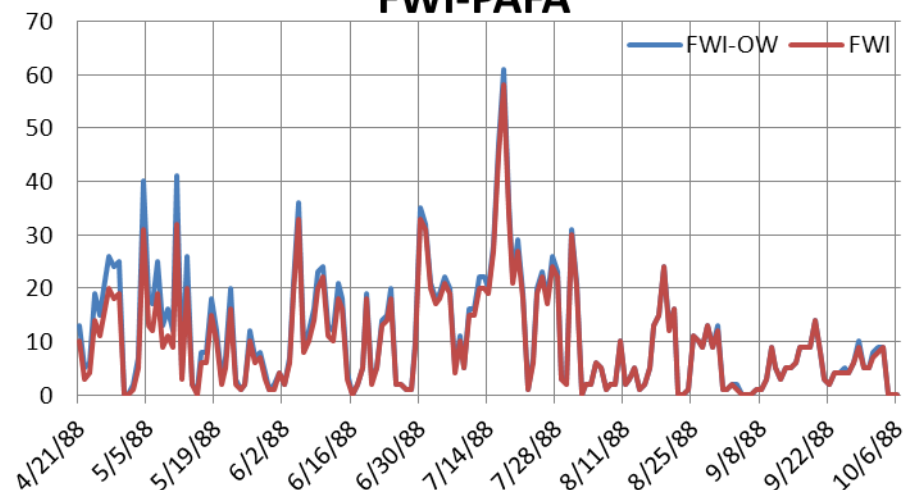
DC-PAFA



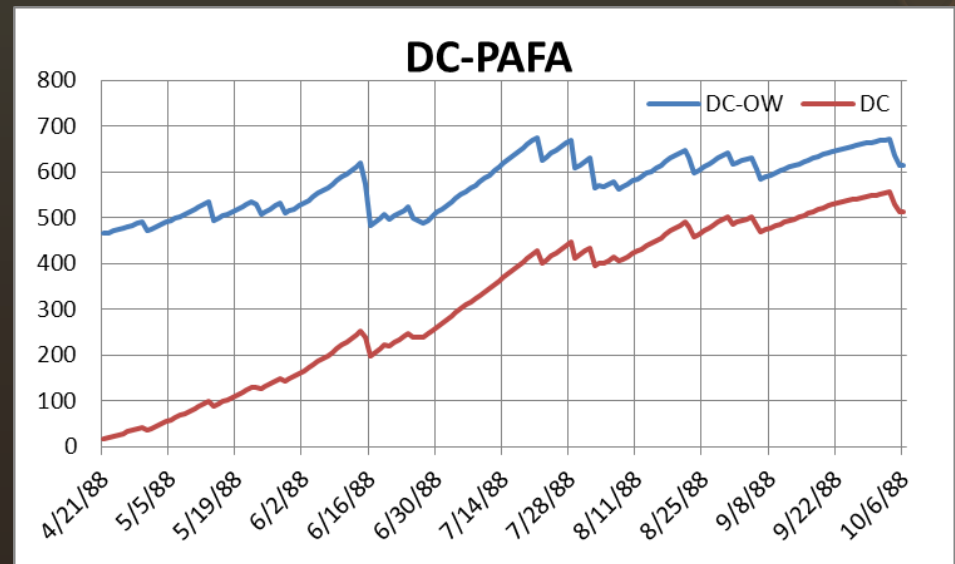
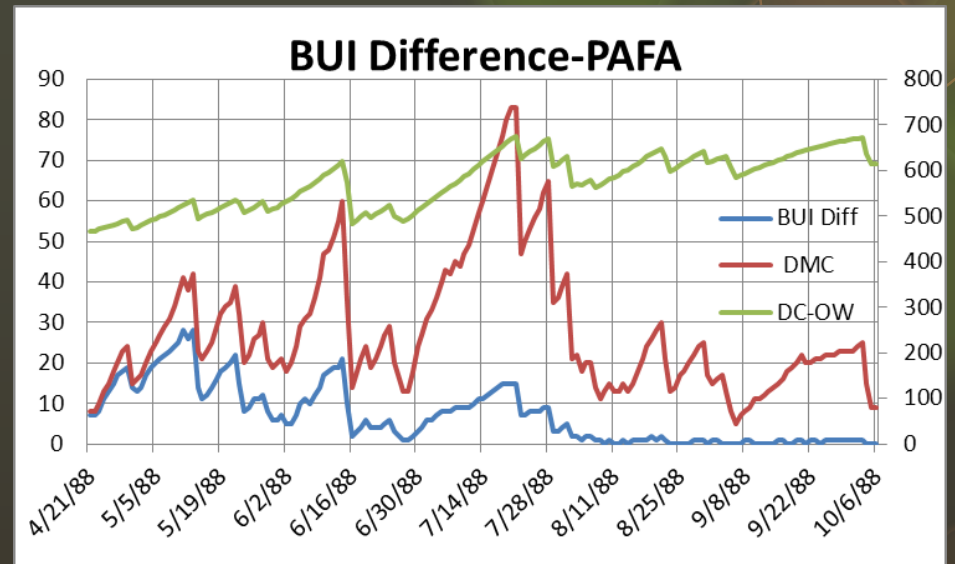
BUI-PAFA



FWI-PAFA



- When would the differences have made a difference?
- What decisions are being made or informed by these indices?
- Largest differences are earlier in the season and after an extended dry period-high DMC.



Overwinter Comparisons

- What we found
 - Differences lessen through the season particularly when there is ample rainfall.
 - The differences in the BUI between overwintering and default are greatest with a high DMC, high overwintered DC and defaulted DC less than 200.
 - The differences in the FWI become less relevant as the differences between the DC's decrease and as the defaulted DC climbs above 200.
- What we really want to know
 - How do these differences relate to what is on the ground?
- Currently some stations are overwintered and some not, based on the protection area or zone management.
 - Should we have a statewide standard?